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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,010	04/21/2004	Wen-Hsi Lee	9751.105USII	5986

23552 7590 09/12/2007  
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MINNEAPOLIS, MN 55402-0903

EXAMINER
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MAYES, MELVIN C

ART UNIT	PAPER NUMBER
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1734

MAIL DATE	DELIVERY MODE
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09/12/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/829,010

Applicant(s)

LEE ET AL.

Examiner

Melvin Curtis Mayes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20,70,71 and 74 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20,70,71 and 74 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

(1)

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 3, 2007 has been entered.

### ***Claim Rejections - 35 USC § 112***

(2)

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(3)

Claims 20, 70, 71 and 74 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for firing the monolithic structure at a temperature to first sinter the constraining layer before the dielectric layer starts to sinter then sinter the dielectric layer, does not reasonably provide enablement for firing at a temperature "less than the sintering temperature of the dielectric layer. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

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According to the specification, both the constraining layer and the dielectric layer are sintered during the firing, however the constraining layer is sintered before the dielectric layer starts to sinter then the dielectric later is sintered , which reduces shrinkage of the dielectric layer. The specification does not provide support for firing at a temperature less than the sintering temperature of the dielectric layer as claimed. If less than the sintering temperature of the dielectric layer, no co-fired ceramic is formed.

(4)

Claim 74 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 74 claims stacking two or more monolithic structures together prior to firing, however, this is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention

***Allowable Subject Matter***

(5)

The following claim 20 drafted by the examiner and considered to distinguish patentably over the art of record in this application and adequately reflect Applicant's invention, is presented to applicant for consideration:

20. A method A method for reducing shrinkage during sintering low-temperature-cofired ceramics, the ceramics comprising a dielectric portion and a heterogeneous material portion, the method comprising the steps of:

(a) providing a dielectric body comprising at least one dielectric layer of low-sintering-temperature ceramic and that comprises at least one active area wherein said active area is disposed with at least one heterogeneous material pattern, and said heterogeneous material pattern comprises at least one heterogeneous material component and/or module;

(b) positioning a constraining layer on the top of the dielectric body to form a monolithic structure, the constraining layer comprising at least one window and wherein the edge of the active area of the dielectric layer each falls within the window in vertical direction, wherein the constraining layer positioned on the top of the dielectric body is a low sintering temperature constraining layer with a sintering temperature lower than that of the dielectric layer and comprises about 1 wt% to about 10 wt% of vanadium oxide to lower the sintering temperature of the constraining layer to a temperature less than the sintering temperature of the dielectric layer;

(c) firing the monolithic structure to a temperature first to sinter the constraining layer before the low-sintering-temperature ceramic starts to sinter then to sinter the low-sintering-temperature ceramic to reduce shrinkage of the low-sintering-temperature ceramic; and

(d) singulating the monolithic structure along a cutting line to provide the low-temperature-cofired ceramics, wherein the cutting line is disposed in the area formed between the edge of the window and the edge of the active area to provide a low-temperature-cofired ceramic comprising vanadium oxide.

(6)

Claim 74 which claims subject matter not described in the specification should be cancelled.

***Response to Arguments***

(7)

Applicant's arguments, see Remarks, filed July 3, 2007, with respect to Claim 20 have been fully considered and are persuasive. The rejection of Claim 20 has been withdrawn.

The Examiner agrees that Knickerbocker et al. does not disclose firing a monolithic structure comprising both a constraining layer and a dielectric layer at a temperature greater than the sintering temperature of the constraining layer and less than the sintering temperature of the dielectric layer, as now claimed. However, Applicant is on notice that if Claim 20 is amended to overcome the 35 U.S.C. 112, first paragraph rejection previously set forth without also amending Claim 20 as drafted by the examiner and presented to applicant for consideration, Knickerbocker et al. may still be relevant as prior art.

***Conclusion***


(8)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Phillip C. Tucker can be reached on 571-272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Melvin Curtis Mayes  
Primary Examiner  
Art Unit 1734

MCM  
September 10, 2007